Operation mode selector switches
Reset button
I2C bus out
Power-on LED
Parallel port 1 - 8-bit input
Auxiliary power in
CPU clock
Main power in
Parallel port 2 - 8-bit output
Power out
I2C EEPROMs
UART clock
Parallel port 3 - 8-bit I/O
8051 CPU
16C552
82C55
ROM
RAM
Printer signal pins
Printer Parallel Port - 8-bit I/O
Serial Port 2 - full handshakes
Serial Port 1 - just RxD and TxD

Overview of the EVTEK-5103 Embedded System

Providing Power for EVTEK-5103:   1) If the main power input is used, connect the **MASCOT 8717** plug
2) If the auxiliary power input is used, connect a standard **9 V battery**

Choosing EVTEK-5103 Operation Modes:

Switch Position:			Mode nr.	Corresponding Operation Mode:	Terminal Response:
MSB (*	mid (*	LSB (*			
LO	**LO**	**LO**	0	Receive a file from PC to Board RAM	"(enter)**RCV:**"
LO	**LO**	**HI**	1	Transmit a file from Board RAM to PC	"(enter)**TMT:**"
LO	**HI**	**LO**	2	Copy lowest 32 kB RAM to EEPROM	"(enter)**R2E:**"
LO	**HI**	**HI**	3	Copy 32 kB EEPROM to lowest RAM	"(enter)**E2R:**"
HI	**LO**	**LO**	4	Start executing program code from 4000h	"(enter)**EXC:**"
HI	**LO**	**HI**	5	Stand-alone – does first mode 3, then 4	"(enter)**S-A:**"
HI	**HI**	**LO**	6	Board's Embedded Debugger CLI Tool	"(enter)**DBG:**"
HI	**HI**	**HI**	7	Test mode – blinks Board's I/O-ports	"(enter)**Test**"

(* when seen from the front, MSB switch is the rightmost, and LSB is the leftmost

Implementing Serial Connection:
Connect the EVTEK-5103 Board's serial port 1 and PC's available serial port with a cross-connected serial cable

Interfacing the EVTEK-5103 from a PC:
It is recommended to use the "EVTEK-5103 Interface" application, that is specifically made for this purpose. The user guide for the application: START MENU → PROGRAMS → EVTEK-5103 → INTERFACE MANUAL

If using a terminal program instead of "EVTEK-5103 Interface" application:
Use Hyperterminal (not under Windows 2000), or Tera Term http://hp.vector.co.jp/authors/VA002416/teraterm.html

Terminal Program Connection parameters:

Baud rate = 57600 kbps	**Data bits** = 8	**Flow control** = none
Parity = none	**Stop bits** = 1	**COM port** = the one you're using on PC
Enter key = CR+LF	**Local echo** = no	**Destructive backspace** = yes
Also, set terminal scrollback buffer to at least 500 lines for convenience of use.		

EVTEK-5103 Board's Programmable Peripheral Datasheets:

8051 CPU:	**AT89C55WD** http://www.atmel.com/dyn/resources/prod_documents/DOC1921.PDF
	DS89C420 http://pdfserv.maxim-ic.com/arpdf/DS89C420.pdf
UART:	**TL16C552** http://focus.ti.com/lit/ds/symlink/tl16c552a.pdf
PIO:	**M82C55A** http://www.okisemi.com/datadocs/doc-eng/msm82c55a_2rs.pdf

Overview of the EVTEK-5103 address space:

Hex Address:	Address Contents:	
0000…1FFF	External EPROM (contains the operating system of the Board)	
2000…27FF	Aux /CS (* = 0 for Serial port 1	Aux /CS (* = 1 for Serial port 2
2800…2FFF	Aux /CS (* = 0 for Printer Par. Port	Aux /CS (* = 1 for Mode Switches
3000…37FF	Aux /CS (* = 0 not used	Aux /CS (* = 1 for Parallel Ports 1 & 2
3800…3FFF	Aux /CS (* = 0 not used	Aux /CS (* = 1 for Parallel Port 3
4000…B3FF	External RAM: free area to be used as program or data memory	
B400…B5FF	External RAM: IE0 Interrupt Vector	
B600…B7FF	External RAM: TF0 Interrupt Vector	
B800…B9FF	External RAM: IE1 Interrupt Vector	
BA00…BBFF	External RAM: TF1 Interrupt Vector	
BC00…BDFF	External RAM: RI & TI Interrupt Vector	
BE00…BFFD	External RAM: TF2 & EXF2 Interrupt Vector	
BFFE…BFFF	External RAM: RESERVED for operation modes 0 and 1	
C000…FEFF	External RAM: free area to be used as program or data memory (**	
FF00...FFFF	External RAM: RESERVED for operation mode 6 (**	
14000…1FFFF	External RAM Upper page: free area (***	
I2C: 0000…7FFF	External Serial I2C EEPROM: RESERVED for operation modes 2 and 3	
I2C: 8000…FFFF	External Serial I2C EEPROM: Free area, not implemented (****	

(* Aux /CS refers to Auxiliary Chip Select (P1.7) line used with the Board's memory mapped I/O addressing.
(** this external RAM area is not copied or overwritten when operation modes 2 or 3 are executed
(*** it is possible to address upper 48 kB page of external RAM by setting the memory page select jumper to RAM page select allowed position and setting P1.6 high.
(**** When appending the second I2C EEPROM to the system, N.B. device address code implementation is required from both EEPROM chips. Also OS I2C routine device addressing requires update.

EVTEK-5103 address space harnessed 8051 port pins:

Pin nr	Pin name	Reserved pins function:	Dir
P1.0	T2	I2C SCL (Serial Clock line)	Out
P1.1	T2EX	extra interrupt /INT2 from the 16C552 Printer Par. Port	In
P1.2		I2C SDA (Serial Data line)	Bi
P1.3		I2C EEPROM WP (Write Protection bit)	Out
P1.4		16C552 PEMD (16C552 Printer Par. Port specific bit)	Out
P1.5		16C552 /ENIRQ (16C552 Printer Par. Port specific bit)	Out
P1.6		SRAM A16 (page select) selection bit	Out
P1.7		Aux /CS (Auxiliary Chip Select bit)	Out
P3.2	/INT0	External interrupt /INT0 – 16C552 Serial port 1	In
P3.3	/INT1	External interrupt /INT1 – 16C552 Serial port 2	In
/EA		External Memory Access (tied to GND)	In

EVTEK-5103 Programming instructions:
1) Start your program with a "**.ORG 4000h**".
2) Open a DOS prompt window in the directory where your *.asm files are located
3) Compile your assembler source code to object file with command **A51 filename** (no ".ASM" needed)
4) If errors were found, you can type **EDIT filename.LST**
5) compile the *.OBJ –file to binary file with command **HEX2BIN /O-16384 filename.OBJ filename.BIN**
N.B: You can download MCS-51 Microcontroller Family User's Manual from www-address ftp://download.intel.com/ design/mcs51/manuals/27238302.pdf. Chapter 2 contains the 8051 Programmer's Guide and Instruction Set.

Debugger: Type a question mark '?' to display the help file.

EVTEK-5103's areas reserved for the Debugger (Board operation mode 7):

Location:	Register	Notation	Function
8051 SFR	TCON bits 6 and 7	TCON.6, 7	8051's Timer 1 run ctrl bit & OV flag
8051 SFR	Port 3 bit 2	P3.2	External Serial Port 1 interrupt input pin
8051 SFR	Port 1 bit 6	P1.6	SRAM page select bit
8051 SFR	PSW bits 3 to 5	PSW.3,4,5	Reg. bank selectors & g.p. user flag
8051 SFR	IE bits 3 and 7	IE.3, IE.7	8051's Timer 1 OV INT & EA
8051 SFR	IP (all bits)	IP	8051's Interrupt Priority Register
8051 SFR	TMOD bits 4 to 7	TMOD.4,5,6,7	8051's T1/C1 mode control register
8051 int. RAM	Stack pointer uses 8051's indirect internal RAM locations 80h…FFh stack space		
External RAM	Memory locations FF00h…FFFFh (breakpoint stack etc.) and BA00h…BA02h (Timer 1 INT vector)		